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MISCELLANEOUS.

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TWO MINOR AUSTRALIAN GOLDFIELDS AND THE ANTIQUITY OF MAN IN AUSTRALIA.[1]

THE goldfield of Forbes and Parkes is situated about 200 miles to the west of Sydney, where the old rocks of the East Australian Highlands disappear beneath the Black Soil Plains. Low spurs from the Palæozoic rocks project westward into the plains, and wide valleys of alluvium run eastward into the foothills. Gold was found during 1861 in the river gravels at Forbes, near the bank of the Lachlan River, and a gold-quartz lode was discovered in the following year at Parkes, on Gooban Creek, a tributary of the Lachlan. Further leads and lodes were discovered at both localities. Mining on the field has, however, been very irregular in its results. The alluvial deposits at Forbes yielded 212,547 oz. in 1862 and 71,493 oz. in 1863; but since then the output from both fields has varied from 57,851 oz. in 1875 down to as low as 1583 oz. Mining at Forbes has at times ceased entirely, and the field is now almost derelict. In the hope of reviving mining there, Mr. Pittman, the Government geologist of New South Wales, arranged for a geological survey of the field to collect trustworthy evidence as to its past history and determine the most likely directions for future mining. The problem of the field is mainly physiographic; and the work was entrusted to Mr. E. C. Andrews, who has already made his mark as an able physiographer. His interesting report is a valuable contribution to the geology of central New South Wales.

The main gold supply of the field has come from its leads, which are buried river channels containing auriferous gravels. These old river beds lie beneath the alluvium, and their working has been hampered by the excessive water with which they are saturated. Alluvial mining has ceased owing to the difficulty of following the deposits into the deeper ground. The methods of deep-lead mining were developed in Victoria, where, as a rule, the gold is found most abundantly in the deep, central river channels. In the Forbes area, however, for reasons which Mr. Andrews clearly explains, some of the richest patches of gold are on the sides of the buried valleys, and he advances weighty arguments that the deep drifts of the old Lachlan Valley would, if discovered, prove too poor in gold for profitable working.

The lode mines of the field are of two types. The foundation of the area consists of Ordovician and Silurian rocks associated with intrusive andesites and andesitic lavas, and covered in places by some Devonian rocks. To the east are some large areas of granite of post-Silurian, but pre-Devonian or Devonian, age. The gold-quartz lodes are associated with the intrusive andesites or occur along crush-zones. Mr. Andrews concludes that the gold has been introduced into the lodes in solution, and did not come from the igneous rocks, and that where gold has been found in igneous rocks in New South Wales it is of secondary origin.

The report includes one item of anthropological evidence that may prove of unusual importance. Hitherto Australia has remained the one continent on which there is no direct evidence of the antiquity of man. It has often been pointed out that, in spite of the thorough search of Australian drifts during mining operations, no early trace of man has yet been found in them. Mr. Andrews records (pp. 19 and 27) the occurrence of some blackfellows' ovens 18 feet below the surface, and associated with remains of Diprotodon. It is to be hoped that a more detailed account of this discovery will be published. On the theory that the Australian aborigines entered Australia in the north-west, and were specialised for desert existence, as they worked their way across Central Australia, it is in such localities as Forbes, where mining operations expose the drifts on the borders of the central plains, that early remains of the aborigines would be expected. Though under special conditions 18 feet of alluvium might accumulate in a short time, the association of the ovens with bones of Diprotodon appears to indicate that Forbes has yielded the earliest trace of man yet found in Australia. Mr. Andrews holds that the whole series of drifts, of which that containing the ovens is one of the later members, is of post-Tertiary age.

Mr. Andrews's memoir is of great interest and unusual merit. The history of the field, too often neglected in such reports, has been carefully compiled, and the features of the country are graphically described and suggestively interpreted. Considering that the closing of the mines prevented the author from inspecting the old workings, he has collected instructive evidence as to the structure of the lodes. His sections, however, give no strong support to his suggestion that the Silurian rocks have been overthrust on to the Ordovicians. As such memoirs are for the benefit of the mining industry, the less familiar terms, such as miarolitic, might be explained in footnotes. The most serious omission is the absence of heights from the map. The scarcity of altitudes on Australian maps is at

[1] The Forbes-Parkes Goldfield, New South Wales, Department of Mines. Mineral Resources. No. 13. Sydney, 1910 (issued 1911). By E. C. Andrews. Pp. iii+109+map+7 plates of plans and sections.

General Report on Tanami Goldfield and District (North-western Central Australia). By L. C. E. Gee. Pp. 22+map+19 illustrations. (Adelaide, 1911.)

present their greatest defect, which is especially marked in this case, as they are indispensable in the study of deep leads.

The map accompanying Mr. Gee's report on Tanami is also heightless. That report tells a very different story. The field was only discovered in 1900, and the great difficulties in its development are in access and scarcity of water. The locality is 50 miles from the frontier of West Australia, 800 miles from the end of the South Australian railways at Oodnatta, and 696 miles from Port Darwin, on the northern coast. The goldfield was visited by Mr. H. Y. L. Brown, the Government geologist, in 1909, and in consequence of his favourable report and the increased number of prospectors, the Government sent Mr. L. C. E. Gee there as warden and magistrate. Mr. Gee has now furnished a very interesting report on the district, the prospecting mining work, the rainfall, climate, and aborigines, with lists of plants collected and birds observed. In spite of its tropical position, Mr. Gee describes the climate as very healthy. The rainfall observed in ten months was 15½ inches, and a good supply of water is often obtained from wells at about the depth of 150 feet. The surrounding country is called desert, but Mr. Gee describes it as containing much fair and some good pastoral country. The mining results hitherto have done little to fulfil the original expectation that at length a great goldfield had been discovered in South Australia.

J. W. GREGORY.

ENTOMOLOGICAL NOTES.

THE U.S. Department of Agriculture is anxious lest the mango-weevil (*Cryptorhynchus mangiferae*), which does so much harm to mango-plantations in other parts of the world, should be introduced into those recently established in Florida. The larva burrows into the seed while soft, where it remains for a considerable period, and is thus carried all over the tropics. In a circular issued by the Bureau of Entomology it is recommended that all mango seeds introduced into America should be opened and examined, and those selected for planting made to germinate under a wire-gauze screen.

The advent between 1900 and 1902 of the sugar-cane leaf-hopper (*Perkinsiella saccharicida*) into the sugar-cane plantations of Hawaii was the beginning of a great calamity which has befallen sugar-growers in four of those islands; for by February, 1903, the insect had spread over the whole area devoted to sugar-culture, and had become so numerous as to constitute a serious pest. Its spread was greatly facilitated by the fact that in those islands only half the crop is harvested at a time, so that there is a continuous supply of nutriment. Moreover, there was an absence of indigenous enemies, although some native species have since taken to preying on the leaf-hopper. The species was introduced from Queensland; and the loss to planters in Hawaii during 1903 and 1904 from this and other insects is estimated at three million dollars. Bulletin No. 93 of the U.S. Bureau of Entomology is devoted to an account of the life-history of the leaf-hopper and the best means of checking its ravages.

In part ii. of the sixth volume of Records of the Indian Museum Dr. J. J. Kieffer continues his description (in French) of the gnats and midges of the family Chironomidæ in the collection of the Indian Museum, naming eighty-seven species as new, the majority of which come from the Oriental region, although others are from the Suez Canal.

Parasitic Hymenoptera from the Transvaal form the subject of a paper by Mr. P. Cameron in vol. ii., No. 4, of Annals of the Transvaal Museum. In a previous paper the author was able to record, from material in the museum, only thirteen local representatives, but, thanks to a collection made by Mr. A. J. T. Janse, he now describes a very large number, some of which represent peculiar generic types, as new. The larval hosts of many of the species are likewise recorded. In this connection it may be noted that the serial quoted suffers from the absence of a table of contents or index to the various numbers.

Mr. J. W. Shoebotham has favoured us with a copy of a paper by himself from the July number of *The Annals and Magazine of Natural History* on spring-tails (Collembola) new to the British fauna, with the description of a new species of Oncopodura, typically from Berkhampstead, Herts. The collection on which the paper is based was mainly made in the counties of Hertford, Buckingham, and Stafford.

Another addition to the British fauna is a coccid taken in ants' nests in Somersetshire by Mr. H. St. J. Donisthorpe, and identified by Mr. E. E. Green, in *The Entomologist's Monthly Magazine* for August, with *Ortheziola rejdovskyi*, a species hitherto apparently known only from Bohemia. At the conclusion of his paper Mr. Green discusses the serial homology of the segments of the antennæ in various members of the Coccidæ.

THE CULTIVATION OF LUCIDITY IN SCIENTIFIC WRITING.[1]

ACCORDING to the reports of examiners for medical degrees, many students seem unable to write an essay or thesis exhibiting any literary quality and style. The fault is not entirely that of the candidates. Whatever subjects they may have learnt at school, the writing of their own language has, in general, not been one of them. Even during their university career the use of the written English language, except as a machine for taking notes or answering examination questions, has not formed any regular part of their course.

The teaching of English is often understood to mean the attempt to teach a literary style by the imitation of good models; but what is really wanted is the power of expressing clearly one's own ideas in one's own language, and this ought now to be within reach of every English-speaking man and woman. The usual methods of teaching English still leave the average boy and girl singularly deficient in the art of saying what they mean on paper, however ready they may be in expressing themselves by the spoken word. This is largely due to the want of systematic practice in writing; moreover, essays are generally criticised by the teacher from the point of view of style rather than in respect of intelligibility. Students should learn to express their own meaning in absolutely clear and intelligible language before they think about the manner in which that language is to be manipulated. A split infinitive is a less important fault than a failure to make the meaning clear. Teachers and examiners of scientific subjects often say of a pupil or an examinee that he evidently understands what he is trying to say, but is merely unable to express his meaning, and then give him full credit for the knowledge and pardon him the failure to express it.

In these circumstances it is not surprising that much scientific writing of the present time is loose and unintelligible in its expression. The remedy is to cultivate the quality of lucidity; this will lay the foundation for a good style.

There cannot be clear writing without clear thinking, and he who learns to write clearly will in the process learn to think clearly. Except in the drafting of resolutions and telegrams, most people have little practice in making their meaning absolutely clear. Letters in the daily papers and many books and memoirs on scientific subjects fail singularly in the quality of lucidity. It would be a good thing if schools and universities had societies which gave their students the same valuable training in the use of the pen which their debating clubs give in the practice of fluent speaking.

In the scientific revival of the nineteenth century the great expositors who wrote with such admirable lucidity led the public to see that the study of science, like that of philosophy, is an education in clear thinking; but now that so much scientific writing is badly expressed, the impression is conveyed that the studies which lead to such loose writing cannot really be conducive to accurate and clear thought. The remedy is in the hands of students themselves, who can, by constant practice in everything that they write and by determination to make their meaning clear, cultivate the essential quality of lucidity before they try to acquire the graces of a good style.

[1] From the introductory address delivered at St. George's Hospital on October 2 by Dr. H. A. Miers, F.R.S., principal of the University o London.